

WHAT IS CLAIMED IS:

1                   1.       An electrosurgical system, comprising:  
2                   an electrosurgical instrument that carries at least one electrode for engaging  
3 tissue;  
4                   a voltage source coupled to the at least one electrode, the voltage source  
5 defining a selected transition impedance level at which its power output-impedance curve  
6 changes from a positive slope to a negative slope; and  
7                   a controller operatively coupled to the voltage source that switches from a  
8 power control mode to a voltage control mode at or about said selected transition impedance  
9 level.

1                   2.       The electrosurgical system of Claim 1 wherein the selected transition  
2 impedance level is between about 10 ohms and 500 ohms.

1                   3.       The electrosurgical system of Claim 1 wherein the selected transition  
2 impedance level is between about 50 ohms and 250 ohms.

1                   4.       The electrosurgical system of Claim 1 wherein the selected transition  
2 impedance level is between about 75 ohms and 150 ohms.

1                   5.       The electrosurgical system of Claim 1 wherein the at least one  
2 electrode is carried in a jaw structure.

1                   6.       The electrosurgical system of Claim 1 wherein the at least one  
2 electrode is operatively coupled to a matrix composition that defines a positive temperature  
3 coefficient of resistance.

1                   7.       An electrosurgical method, comprising the steps of:  
2                   providing an electrosurgical electrode having an engagement surface for  
3 engaging tissue;  
4                   providing a voltage source coupled to the electrode, the voltage source  
5 exhibiting a power output-impedance curve that defines a positive slope to an apex and then  
6 defines a negative slope with increasing impedance; and  
7                   causing ohmic heating of the engaged tissue wherein a feedback control  
8 system modulates power to the electrode when the power output-impedance curve is

9 positively-sloped and modulates voltage to the electrode when the power output-impedance  
10 curve is negatively-sloped.

1                   8.       An electrosurgical system for delivering energy to targeted tissue,  
2 comprising:  
3                   an electrosurgical instrument having a working end that carries a conductive  
4 material for engaging tissue;  
5                   an Rf source operatively coupled to the conductive material, the Rf source  
6 defining a selected transition impedance level at which its power output-impedance curve  
7 changes from a positive slope to a negative slope; and  
8                   a controller coupled to the voltage source;  
9                   wherein the controller modulates power to the working end and engaged tissue  
10 when the power output-impedance curve has a positive slope; and  
11                   wherein the controller modulates voltage to the working end and engaged  
12 tissue when the power output-impedance curve has a negative slope to prevent any arc of Rf  
13 energy.

1                   9.       The electrosurgical system of Claim 8 wherein said transition  
2 impedance level is between about 10 ohms and 500 ohms.

1                   10.      An electrosurgical jaw structure for delivering energy to engaged  
2 tissue, comprising:  
3                   first and second openable-closeable jaw members, at least one jaw member  
4 defining a first peripheral portion and a second central portion wherein the second portion is  
5 recessed relative to the first portion;  
6                   at least one jaw carrying a conductive material; and  
7                   an Rf source operatively coupled to the conductive material.

1                   11.      The electrosurgical jaw structure of Claim 10 wherein the second  
2 portion is recessed relative to the first portion by at least 0.0005 inch.

1                   12.      The electrosurgical jaw structure of Claim 10 wherein the second  
2 portion is recessed relative to the first portion by between about 0.0005 inch and 0.020 inch.

1                   13.      The electrosurgical jaw structure of Claim 10 wherein the second  
2 portion is recessed relative to the first portion by between about 0.001 inch and 0.010 inch.

1                   14.     The electrosurgical jaw structure of Claim 10 wherein the second  
2     portion is recessed relative to the first portion by between about 0.003 inch and 0.007 inch.

1                   15.     The electrosurgical jaw structure of Claim 10 wherein the conductive  
2     material is carried in the second portion.

1                   16.     The electrosurgical jaw structure of Claim 10 wherein the conductive  
2     material comprises at least in part a positive temperature coefficient material.

1                   17.     An electrosurgical jaw structure for delivering energy to engaged  
2     tissue, comprising:

3                         first and second paired jaw members each defining a respective surface  
4     engagement plane for contacting tissue, the paired jaw members moveable between an open  
5     and closed position;

6                         the paired jaw members defining a peripheral portion and a central portion;

7                         wherein the paired jaw members in the closed position define an engagement  
8     gap between respective engagement planes that has a first dimension in the peripheral portion  
9     and a second dimension in the central portion, and wherein said second dimension is greater  
10    than said first dimension.

1                   18.     The electrosurgical jaw structure of Claim 17 wherein the difference  
2     between said first and second dimensions is at least about 0.0005 inch.

1                   19.     The electrosurgical jaw structure of Claim 17 wherein the difference  
2     between said first and second dimensions is at least about 0.001 inch.

1                   20.     The electrosurgical jaw structure of Claim 17 wherein the difference  
2     between said first and second dimensions is at least about 0.003 inch.

1                   21.     The electrosurgical jaw structure of Claim 17 wherein said second  
2     dimensions is at least 110% of said first dimension.